expert

EXkeypad Stand Alone Programmer

(5002-2070)

User Manual

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Foreword

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Cautions and Notes

The following symbols are used in this guide:

CAUTION! This indicates an important operating instruction that should be followed to avoid any potential damage to hardware or property, loss of data, or personal injury.

NOTE. This indicates important information to help you make the best use of this product.

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1. Introduction

1.1 How to use this manual

This manual gives details on the programming of EXpert access control units (ACU's) using the EXkeypad programmer.

This **Introduction** section contains the following:

- A description of how to use the EXkeypad
- A MENU 'map' of how the programming menus are arranged.

The **Overview** section contains a brief description of every option that can be programmed in an EXpert 2 access control unit (ACU)
The **Reference** section contains details of each feature.
Both the Overview and Reference sections present the features in the same order that they appear in the EXpert menu. The **Index** section lists them alphabetically.

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2. How to use the EXkeypad

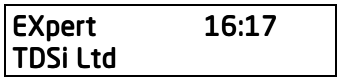
2.1 Key functions

Number keys	These are used to enter numerical data. Below the number keys are the letters of the alphabet. These keys are used to enter letters when adding names to cards
Up /Down arrows	These are used to scroll through the list of menu options in either direction. Sometimes, instead of typing in values, the up/down arrows can be used to increase/decrease the number shown on the display.
Left & Right arrows	These are used to position the cursor to enter data, and make corrections when entering data.
# Key	This is the **Quit** key. Pressing this key partway through any programming operation cancels the current action. In most cases the user is taken back up one menu level, and any data entered has been cancelled.
*** Key**	This is the **Execute** or **Enter** key. Pressing this key will either open the displayed menu item, or accept the data on the display and store it in memory.

When you first plug in the EXkeypad, or if you power up the ACU with it already connected you will get the default display:
Which provides some useful Functions –

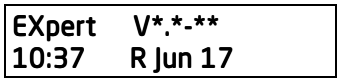
These are then available before going into the Main menu

- On default screen location:



Press Up arrow or Down arrow:
Gives the events: – upper most event = the last event

- **Firmware Version**
  Press # and you get the firmware version:



- **UID Number**
  Press # then Up arrow to get the UID number of the Expert master

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2.2 Starting programming - Going into the Main Menu Map

Programming is password-protected – press any key and you get a request for

- PIN:

Enter the password (the default is 1234) and press the enter (*) key. If it is more than 10 minutes since the EXkeypad was used for programming, then it will have "timed out" of programming mode, back into normal operating mode, with the time and date shown on the display.

- Selecting a menu item

Use the UP and DOWN arrows to scroll through the various Main Menu options. When the desired option is showing on the display, press "*" to execute and the user is taken into a list of sub menu's for that main menu option selected.

- Entering data

There are some occasions when the user can't scroll through the options, for example when entering card numbers or names. Simply enter the information required and press "*" when finished. When entering names the user will be required to press the right arrow every time a letter is entered. To make corrections, use the LEFT and RIGHT arrows to position the cursor beneath the character or figure to be corrected. The cursor does not have to be at the end of the line to enter data.

- Deleting data

As there is no Delete key, in most cases you delete data by replacing it with a string of zeros.

- Returning to the main menu

Wherever you are in the menu system, keep pressing the Quit key (#) until the top line shows 'MAIN MENU'. If you press the quit key again you will come out of the Menu Map and will need to put your password again to enter the menu.

- Selecting doors, readers, relays and inputs

Some operations require that you identify which items you wish to affect. This means selecting one or more of all of the possibilities, and the display looks something like this:

```
1234567890123456
0000000000000000
```

In such a display, the top row represents 16 relays (for example), numbered 1-16 but with the leading "1" left off those in the range 10-16. The second row shows which items are selected – a 1 means selected; 0 is not selected.

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In the case of doors and readers, the configuration will determine which numbers are utilised; an X is used to denote any that are not used (e.g. redundant doors in a two-reader one-door configuration). The following table shows the numbering that applies. It is important to realise that, for example, readers on EXpander no.7 will always be 15 and 16 even if it is the only EXpander unit online in the system.

Type	Sub Unit No.	Door or Reader No.
EXpert	0	1
		2
EXpander	1	3
		4
EXpander	2	5
		6
EXpander	3	7
		8
EXpander	4	9
		10
EXpander	5	11
		12
EXpander	6	13
		14
EXpander	7	15
		16

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2.3 EXpert Menu Structure

ACU Functions	Door Functions	Lift Functions	Reader Functions
PIN-only digits	Which door?	Which lift?	Which reader?
Memory options	Lock Time	Select time	Reader type
Language	Door sensor type	Select sense	Anti-passback
Full ID prompts?	Ajar time (L)		Led type
Mode	Ajar time (R)		Down counter
Auto-fallback	Alarm shunt off		Up counter
	Mantrap		Name
	DDA time		N-Card
	Lock drive end		N-Card count
			N-Card time

Validate	Void	Access Modes	Relays	Inputs
Which reader?	Void Id	Control	Control	Which unit?
Validate card	Void PIN	Program	Program	Polarity
Validate PIN	Block Void	Holidays	Holidays	Type
Block validate		Control card	Hold-on time	On delay
Forgive ID			Control Card	Off delay
ID reader				Use
				Up counter
				Down counter

Counters	Timegroups	Messages	Printouts	Communications
Value	Control	Access messages	System	Unit number
Limit	Program	Alarm messages	Readers	Mode
Relay	Holidays	Input messages	Doors/Lifts	Baud rate
Reset	Control card	Relay messages	IDs	Parity
Reset value		Mode messages	Access modes	Flow control
		TG messages	Relays	
		Counter messages	Inputs	
			Time groups	
			Counters	
			Messages	

Clock	Diagnostics	Resets	Password	Unit Control
Time	Input test	Warm restart	Change password	Reset Unit
Date	Relay test	Erase id store	Multi-user mode	Unit info
Date Format	Ram test	Erase events	Modify user	Identify unit
Clocks forward	Rom CRC	Reset parameters		UID <-----> Unit
Clock back	Comms test	System Reset		Change unit
Holidays				Number of Units

3. Overview of menu features

3.1 ACU Functions menu

Pin-Only digits options

If PIN-only access is allowed, this determines how many digits are required in the PIN.

Memory options

This determines how the available memory is to be shared between Cards, Events and Time Control Lines (TCL's). It also allows the choice of storing names against cards (only needed if connected to a printer), and if so how many characters to reserve for each name.

Language

Allows selection of the language used for on-screen prompts, and messages printed at the printer.

Full ID prompts

It allows the user to decide in advance which card attributes are to be input when validating a card or PIN. When the user validates cards or PINs, the user will only be prompted for those attributes chosen. The prompts, which can be enabled or disabled are: PIN with Card, Time Group, and Expiry. Default is all prompts OFF.

Mode

This allows the user to set up the ACU (and each of its slave units) for the correct number of doors and readers, or to enable Lift control.

Auto-fallback options

Normally, the decision to grant access is taken by a master ACU, even when a card is used in a reader controlled by a slave. Auto-fallback allows a slave ACU to grant access if it loses communications with its master, for any reason.

3.2 Door Functions menu

Lock time

This is the maximum duration that the lock release relay will be energized. The relay is de-energized if the door opens before this time has expired. Default is 5 seconds.

Door sensor type

This allows connection of either normally-open or normally-closed contacts. Default is normally-closed (i.e. door open = contacts closed).

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Ajar local time

If the door stays open for more than the specified door ajar local time then the DOOR AJAR (L) alarm is triggered: this may be a message to the printer and/or a relay trigger. Default is 15 seconds.

Ajar remote time

If the door stays open for more than the specified door ajar remote time then the DOOR AJAR (R) alarm is triggered: this may be a message to the printer and/or a relay trigger. Default is 45 minutes.

Alarm Shunt Off

If the door stays open for more than the specified door ajar remote time then the DOOR AJAR (R) alarm is triggered: this may be a message to the printer and/or a relay trigger. Default is 45 minutes.

Mantrap

This can be used to prevent someone going through one door unless another door is closed.

DDA time

This adds extra time to the standard door opening times for those persons that have been given the DDA (Disabled Disability Allowance) option when validating their card.

Lock Drive End

This option is used to provide a solution for those using monitored locks. The default TDSi setting only recognises door open and door locked, whereas a monitored lock recognised a third state of closed door but not locked.

3.3 Lift Functions menu

This allows up to 36 floors to be controlled when an I/O board is used; each card can be allowed access to any combination of the floors. This menu is only accessible when the ACU is configured for elevator control.

Wiring the relays to the Button control in the lift: the

Select time is for how long the relay should fire active

Select sense is for the relay to be either normally closed or normally open

3.4 Reader Functions menu

Reader type

Allows selection of reader technology from the following: Microcard®, Wiegand or Magnetic (If using mag-stripe swipe readers, cards can be used in either direction through the reader). Wiegand cards may be TDSi's unique 40-bit cards or any 26-bit format.
Note that proximity readers should be set up as magnetic as this is their data communication format.

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Note on Reader Type Auto-Detection

(After initial power-up, or after a system reset). If a card is presented at a reader wired to the EXpert 2 ACU, the system will automatically set all other readers attached to the ACU and associated EXpanders to the same reader technology by default. The user will be required to re-program readers with the correct technology if they are different from the one set as default.

Anti-passback

There are two types of anti-passback (APB): True and Timed. True APB prevents a card from being used at one reader twice in succession; i.e. the card must be used to go 'out' before it can be used to come 'in' again. Timed APB prevents a card from being used twice within a chosen time period (1 minute to 24 hours). A Forgiveness feature allows a 'reset' to be carried out. The default setting is no anti-passback.

LED type

Some readers supplied by TDSi are single colour while others are bi-color. EXpert will make use of bi-color LED's to signal access granted (green) and access denied (red) provided the correct type is selected in this menu.

Down Counter

This allows you to choose which counter (out of a possible 16) will be decremented each time a card is granted access.

Up Counter

This allows you to choose which counter (out of a possible 16) will be incremented each time a card is granted access.

Name

The name that will be displayed on the reader's display. The name will also be used instead of the reader number in Printouts and event reports.

N-Card (Multi Card Access + Multi Tap)

This is used select which mode of Multi Card Access is required; this being a multiple of persons required to present their access card to gain access via a reader.

Also Multi Tap is available for Unlocking a door, for as long as required and then Multi tap again to Lock a door back to normal Access mode. For example a Teacher may want the classroom unlocked during the Lecture.

N-Card count

How many users are required to present their access card to gain for access to the door.

N-card time

How long is given between for each person to present their card before the "time out" occurs.

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3.5 Validate menu

Validate card

This validates a new card or edits one that is already in memory. If it is a new card, the user will be prompted for the minimum of:
In which reader(s) the card is to be validated
The number of the card

Validate PIN

Same as 'validate card', but the user is prompted for a PIN instead of a card number.

Block-validate

Validates a range of cards, all with the same time group and expiry limit, from a start to an end number.

3.5.2 Forgive ID

You can enter the ID to remove any Anti passback enforcements to the ACU readers.

ID Reader

Assigns a reader for use when validating cards, instead of having to type in card numbers. This is also useful for when the card has no visible number, or when the number read by EXpert is different from the number printed on the card.

3.6 Void menu

Void ID

If the card is in memory, the user will be shown the reader(s) at which the card is valid. On the bottom line of the display, a '1' represents a reader where ID is valid and an 'X' represents a reader where the ID is not valid. Simply change the '1' to a '0' to void the ID for the specified reader.

Void PIN

Same as 'Void ID'.

Block-void

Voids a range of cards from a start to an end number.

3.7 Access Modes menu

Card-Only

This is the default mode – access is granted when a card is presented at the reader (subject to various conditions being met) without the need for a PIN.

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PIN-only

This mode allows access without a card if the reader has a keypad. The length of the PIN can be from 4 to 8 digits. This mode can be on permanently, or follow a schedule. The mode can also be manually enabled and disabled using an input or a control card. A Duress function can raise an alarm if a user is forced to open the door.

Card+PIN

This mode requires a user to enter a 4-digit PIN after presenting their card. The PIN can be defined by the administrator, or chosen upon first use. This mode can be on permanently, or follow a schedule. The mode can also be manually enabled and disabled using an input or a control card. A Duress function can raise an alarm if a user is forced to open the door.

Relays menu

There are four relays on each EXpert master (EXpert) and each of its slaves (EXpander). Either one or two relays are used for the lock, depending on the configuration, and the spare relays can be used for annunciating alarms or other form of control. Fitting an expansion board provides additional relays – EXout 32 adds 32 relays while EXin/out 32/16 adds 16 relays.

Inputs menu

There are 8 inputs on each EXpert master (EXpert) and each of its slaves (EXpander). Either two or four inputs are used for door sensor and egress, depending on the configuration, and the spare inputs can be used for monitoring other devices. Fitting an expansion board provides additional inputs – EXin 32 adds 32 inputs while EXin/out 32/16 adds 32 inputs.

3.8 Counters menu

EXpert maintains 16 counters which can be used to trigger relays when limits are exceeded. Counters can be incremented and decremented by inputs and access granted events. By using a relay to disable a reader, for example, it is possible to limit the number of cars that can be in a car park at any one time.

3.9 Time groups menu

There are 64 time groups (group 0 always allows 24-hour, 7-days a week access; groups 1-63 are programmable): A card can be assigned to different time groups at different readers. A time group consists of a series of time control lines: define a time, day(s) of the week and whether access is 'free' or 'barred' from this time forward.

3.10 Messages menu

This controls which messages are sent to the printer and reader displays.

3.11 Printouts menu

If “immediate” mode is chosen in the Communications menu, this menu becomes available, the controller will send event reports directly to the

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printer as and when they occur. The PRINTOUTS option in the main menu is a separate function to allow the user to interrogate the controller. The user can request reports on each of the programming functions and their current settings.

3.12 Communications menu

This is used to determine whether EXpert 2 will communicate with a PC or a printer. In the case of a printer, various parameters such as flow control and word length may be set.

3.13 Clock menu

This is used to set the correct date and time and to pre-program the changeover for daylight saving times.

3.14 Holidays

This determines whether or not certain features (Relays, Time Groups, Card+PIN access, and PIN-only access) are active on pre-defined holidays.

3.15 Diagnostics menu

This allows various parts of the hardware to be tested. During diagnostics, all access control functions are halted and the EXpander units go into auto-fallback mode

3.16 Resets menu

There are several RESET functions available, which clear certain parts of the programming and return the ACU into a known state.

3.17 Password menu

This allows control of the master password. Also, multi-user mode can be selected to define up to 10 users, each with a unique password and own access rights.

3.18 Unit Control menu

This allows the monitoring and control of individual slave units.

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4. Reference Section

4.1 ACU Functions menu

PIN-only Digits

Menus	Default	Options
ACU Functions: PIN-only digits	4	4 5 6 7 8

The PIN-only feature allows access without the use of a card, simply by keying in a number at the Dataline keypad beside the reader. The administrator can choose how many digits are required for every PIN-only entry; 4, 5, 6, 7 or 8. Full details of this mode of operation are described in the Access Modes.

To reduce the risk of people trying to guess PIN-only numbers, we recommend increasing the number of digits according to the number of valid PIN-only numbers in the system.

To greatly reduce the probability of a PIN number being used by an unauthorised person, then it is recommended that more digits are used than the table suggests.

Number of People	Number of digits
10	4
100	5
1,000	6
10,000	7

If the user changes the number of digits in PIN-only numbers, then existing PIN-only numbers will not be erased but will require extra 0's at the beginning of the PIN depending on how many extra digits the PIN has been assigned. We strongly recommend that an "Erase ID store" reset is performed; this will clear the memory of PIN numbers and will also remove all card numbers. This is therefore something that should be done during installation before too many cards have been validated.

Here is an example of changing from a 4 digit PIN to a 5 digit PIN with PINs already valid in the system ACU's:

1234 4 number PIN

01234 PIN increased from a 4 PIN to a 5 PIN

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Memory Options

Menus	Default	Options
ACU Functions: Memory Options: Names with cards	without names	with names without names
ACU Functions: Memory Options: No. of TCL's	496	see text
ACU Functions: Memory Options: No. of events	10000	see text
ACU Functions: Memory Options: Names with cards	15,000	see text

This allows the user to choose how the memory is allocated for cards, events and time control lines (TCL's). In addition, a user can choose to add names of up to 16 characters to cards and this also affects the memory usage.

The EXpert board is available with 1 Megabyte of RAM. Card capacity is dependent on the number of EXpander units that are defined in 'number of units'. Reducing the number of EXpanders will increase the card capacity of the EXpert.

It is strongly recommended that if a user wishes to expand their EXpert installation in the future, the number of EXpander units should be left at the default setting of Changing the number of units later on will erase IDs that are in memory because the memory partition has to be reconfigured.

TCL's

If the user increases the number of TCL's, first the event partition automatically decreases. When there is only one event left, if the user increases the number of TCL's then the cards partition automatically decreases. If the user decreases the number of TCL's, the event partition automatically increases. In both cases, all TCL's, events and cards are erased from memory. **Even if the user does not change the displayed number, pressing "*" will cause the contents of all three memory partitions to be erased.** Press "#" to keep the current memory partitions, no data will be erased.

Events

If the user increases the number of events the cards partition automatically decreases. If the user wants more events than this allows, the number of TCL's must be decreased. If the user decreases the number of events, the card partition automatically increases. In both cases, all events and cards are erased from memory. **Even if the user does not change the displayed number, Pressing "*" will cause the contents of both memory partitions to be erased.** Press "#" to keep the current memory partitions, no data will be erased.

Cards

If the user increases the number of cards the events partition automatically decreases. If the user wants more cards than this allows, the number of TCL's must be decreased. If the user decreases the number of cards the events partition automatically increases. In both cases, all events and cards are erased from memory. **Even if the user does not change the displayed number, pressing "*" will cause both contents of memory partitions to be erased.** Press "#" to keep the current memory partitions, no data will be erased.

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Names with Cards

When the feature is on, each card can have an associated name stored. There is a maximum of 16 characters that can be assigned to each card. The more characters used, the more room in memory each card will take up thus reducing the max number of cards available. It is recommended that names be entered into the EXkeypad when validating the IDs. An event list can be printed that will also show the cardholder's name beside each card event.

Language

Menus	Default	Options
ACU Functions: Language	English	English Français Deutsch etc.

This option allows the user to select the language used for the on-screen prompts on the EXkeypad. The same language will also be used for messages to the printer.

Full ID Prompts

Menus	Default	Options
ACU Functions: Full ID Prompts	Off	Off On

This feature allows the user to enable or disable whether additional prompts are given when validating IDs. When validating cards into the system it will now display all prompts, which will include PIN number, time group, start date with time and finish date with time.
When block validating, PINs cannot be entered, but the time group and expiry date is applied to all IDs in the block.

Mode

Menus	Default	Options
ACU Functions: Mode: Which unit?	R2D2	R2D2 R2D1 R1D1 Lift Controller

This feature enables the installer to select the ACU configuration of each unit by entering the reader/door configuration. This will also determine how the inputs and relays are configured on the ACU.
The lift control mode of operation means that when a card is used at a reader, a combination of relays with be activated. These relays can be wired in series with lift-car buttons, or connected to a suitable interface on the lift control equipment.

Auto-fallback

Menus	Default	Options
ACU Functions: Auto-fallback	On	On Off

If communication between the EXpert and an EXpander fails then the EXpander can operate in fallback mode. In this mode, the EXpander will

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unlock the door if a card is used that is between the lowest and highest card numbers in memory. Note that the following limitations apply:

- No time group systems
- No expiry systems
- No Pin only or Card+PIN
- No anti-passback
- No cross-unit input/output mappings
- No occupancy system counters
- The last 100 events for each EXpander are stored.
- All floors are enabled when IDs are used for lift controllers.

If auto-fallback is off no IDs will gain access through the EXpander in the event of communications failure.

4.2 Door Functions menu

Lock Time

Menus	Default	Options
Door Functions: Which Door?: Lock Time	5 seconds	0-99 seconds

This allows the user to set the maximum duration that a lock strike relay will be energized on a valid access event (Card entry, Card+PIN entry, PIN-only entry, Egress button pressed). If a door sensor is fitted, the lock strike relay is de-energized if the door closes before this time has expired.

Door Sensor Type

Menus	Default	Options
Door Functions: Which Door?: Door sensor type	Normally Closed	Normally Open Normally Closed

This function allows the user to choose which type of door sensor is fitted: normally open (door open = contacts open) or normally closed (door open = contacts closed). The installer would normally set this function up during installation.

For access control the door sensor provides an extra level of security in the following way. If the lock release time is set to, say, 10 seconds, it is quite possible for someone to pass through the door in only two or three seconds after using their card. This leaves seven or eight seconds of 'un-expired' time, during which (if no door sensor was fitted) the door could still be opened. However, if a door sensor is fitted, then as soon as the door opens the lock release is de-energized.

For access monitoring, having a door sensor fitted means that all occurrences of the door opening and closing can be monitored. Also, relays can be set to operate if a door opens when it shouldn't (door forced), or stays open for too long (door ajar). These occurrences will also be reported. If a relay is programmed to provide an Alarm Shunt, then the door sensor also determines when the Alarm Shunt relay is turned off. The user can program whether the relay turns off as the door closes, or as the door ajar (local) alarm triggers, or as the door ajar (remote) alarm triggers. This is covered in the section headed "Alarm Shunt".

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Ajar Time (Local)

Menus	Default	Options
Door Functions: Which Door?: Ajar Time (local)	15 seconds	1-99 seconds

An event message will be generated when a door has been left open longer than the specified time. This event can also be used to activate a relay to operate an audible alarm.

Ajar Time (Remote)

Menus	Default	Options
Door Functions: Which Door?: Ajar Time (remote)	5 minutes	1-99 minutes

An event message will be generated when a door has been left open longer than the specified time. This event can also be used to activate a relay to operate an audible alarm.

Alarm Shunt Off

Menus	Default	Options
Door Functions: Which Door?: Alarm Shunt off	Door Ajar (L)	Door Ajar (L) Door Ajar (R) Door Closed

If the user has programmed a relay to provide an alarm shunt function (i.e. to bypass door-sense contacts on an intruder alarm system) then they can also program which one of three events will cause the relay to de-energize. If the door does not open at all, the alarm shunt relay is de-energized when the lock strike time expires. See the Relays section of this manual for details on how to program a relay for this purpose.

Door ajar (L)	The alarm shunt relay will be de-energized when the Door Ajar (Local) time expires. This does not require a relay to be programmed as a Door Ajar (Local) alarm. The intruder alarm system can therefore signal the Door Ajar (L) alarm.
Door ajar (R)	The alarm shunt relay de-energises when the Door Ajar (Remote) time expires. This does not require a relay to be programmed as a Door Ajar (Remote) alarm. The intruder alarm system can therefore signal the Door Ajar (R) alarm.
Door closed	No matter how long the door remains open, the Alarm Shunt relay de-energizes only when the door closes.

Mantrap

Menus	Default	Options
Door Functions: Which Door?: Mantrap: Group	0	0-255
Door Functions: Which Door?: Mantrap: Inner/Outer	Inner	Inner Outer

The Mantrap function is normally used in those applications where a person enters an outer room, or holding area, before proceeding into the main part of the building. In these applications it is normal to stipulate that the inner door cannot be opened unless the outer door is closed. This may be for security reasons, or it may be for environmental control; e.g. where an airlock is required.

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Restrictions

Mantrap can be applied to any combination of doors in the system. Mantrap parameters would normally be set up during installation and never need changing. Mantrap can be applied across all 16 doors.

If mantrap is on

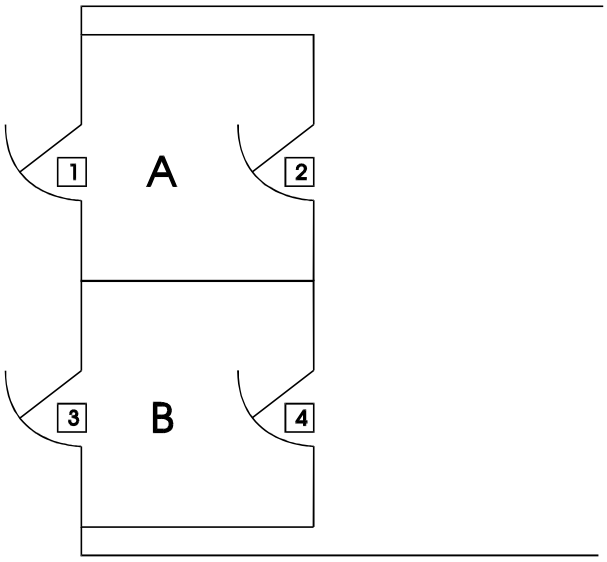
Access through a door will only be granted all other doors in the same group are closed. Of course, all other access criteria have to be satisfied as well. If access is denied due to the mantrap function, any relay programmed to come on for BAD ID (i.e. access denied) will be energized.

Programming mantrap

Programming mantrap requires setting two parameters for each door:

1. the mantrap "group" to which the door belongs
2. Whether the door is an inner or an outer door in that group.

   Consider the following example:



The above shows one building with two entrances, each entrance requiring a mantrap.

- Door 1 allows access to foyer "A", and Door 2 allows access to the inside of the building.
- Door 3 allows access to foyer "B", and Door 4 allows access to the inside of the building.

So Doors 1 and 2 are in one mantrap group, Doors 3 and 4 are in another. Doors 1 and 3 are outer doors; doors 2 and 4 are inner doors. In this example, the user could swap the inner and outer doors when programming - the terms "inner" and "outer" are simply used to distinguish between the doors in each group.

General notes regarding mantrap

- There is no mantrap enable/disable option. Mantrap is automatically enabled if two doors have the same group but different inner/outer settings.

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- Ensure that non-mantrap doors are in a different group. For example, if Doors 1 and 2 are used for a mantrap then Door 3 and Door 4 must be in two different groups; i.e.: Doors 1 and 2 in group 1, Door 3 in group 2, Door 4 in group 3

DDA time

Menus	Default	Options
Door Functions: DDA time? (seconds)>	10 seconds	0-99 seconds

A door is set to open for a default of 5 seconds but where persons with a disability require longer times then when validating a card for that person you can select DDA to yes. This will then add the value applied for the DDA to the set door open times.

Lock Drive End

Menus	Default	Options
Door Functions: Lock Drive End>	DO+DC+TIME	DC+TIME TIME

This option is used to provide a solution for those using monitored locks. The default TDSi setting only recognises door open and door locked, whereas a monitored lock recognised a third state of closed door but not locked.
The three options are default
DO (door open) + DC (door closed) + TIME this means any of the three actions DO, DC, TIME will lock the door when the door is pulled into the closed position. If you have a monitored lock then the Door Open action will trigger to lock the door before you have had time to open it, so this option is not suitable for monitored locks.
DC + TIME this means that only the Door Closed action or after the TIME period (default 5 seconds) will the door lock once the door is pulled into the close position.
TIME this means only after the TIME period (default 5 seconds) will the door lock once the door is pulled into the close position.

The reason why TDSI chose option 1 as default is that when a door opens this triggers the lock function as soon as the door is closed, so even if someone went through the door in two seconds the door will lock and stop any tailgating.

Lift Functions menu

Menus	Default	Options
Lift Functions: Which Lift?: Select Time	5 seconds	0-99 seconds
Lift Functions: Which Lift?: Select Sense	Normally closed	Normally closed Normally open

If an ACU has been configured as a Lift Controller (ACU Functions: Mode menu), these two menu items become available and have the following significance:

Select Time

The length of time for which relays are energized after a valid card is presented

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Select Sense

If required, the Door 1 sensor can be used to de-energize all relays. This menu item allows the correct polarity to be chosen.

4.3 Reader Functions menu

Reader Type

Menus	Default	Options
Reader Functions: Which Reader?: Reader Type	Microcard	Microcard Wiegand Magnetic

The first time an ACU is powered up after installation, or after a System reset or Parameter Reset, Reader Type is be set automatically upon the first use of a card (this sets it for all readers controlled by EXpert). This menu item allows the over-ride of the automatic setting, for example if the installation has two types of reader.

Microcard®

TDSi's unique card reading technology is based on the use of infra-red light passing directly through the card within which a security code is embedded. The Microcard® reader reads the code by measuring the amount of light passing through the card. Each card number is unique, encrypted and fixed at the point of manufacture: its identity can never be altered. Two options for this technology exist: Normal decode and 63-bit decode. The second option further reduces the already small chance of numbers being miss-reported but increases the chances of failure to read.

Magnetic

Magnetic stripe is the traditional card reading technology used widely on bank and loyalty cards. A number is encoded onto the magnetic material on the reverse of the card. As the card is swiped through the reader, a magnetic head reads the information encoded on the stripe. This option automatically permits bi-directional reading. If this is selected, but an insert reader is used, the card will be read twice - once going in and again coming out.
Note that most proximity readers supplied by TDSi utilise magnetic output format, and so this format must be selected in this menu.

Wiegand

This menu item offers four choices:

TDSi Proximity	This format applies to Cotag and Motorola/Indala readers.
TDSi Wiegand	Wiegand cards supplied by TDSi contain a 40-bit code. The first 8 bits are unique to TDSi. TDSi guarantees never to duplicate one of its Wiegand card numbers.
26 bit Wiegand	A long-established industry standard utilising a 3-digit site code and a 5-digit card number. If the format of the card doesn't follow this standard then the card number will be decoded as a single eight-digit number.
Unknown Wiegand	This allows custom formats to be used.

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Anti-passback

Menus	Default	Options
Reader Functions: Which Reader?: Anti-passback: Enable	Off	On Off
Reader Functions: Which Reader?: Anti-passback: Check readers	0	0 1-16
Reader Functions: Which Reader?: Anti-passback: Clear readers	0	0 1-16
Reader Functions: Which Reader?: Anti-passback: Time	0	0-1440 minutes
Reader Functions: Which Reader?: Anti-passback: Forgiveness	Never	Never Timed Now

Anti-passback (APB) is used to stop two people from using one card to gain access. If access is denied because of this, an alarm message will be reported. A relay may also be energized.

Check readers

When a card is used, EXpert 2 will check to see if there is a record of this card having been used at any of the readers specified in this menu. If so, then access will be denied.

Clear readers

When a card is granted access, EXpert 2 will check to see if the card was last used at any of the readers specified in this menu. If so, then the record of this usage will be cleared.

Time

The Time option gives an alternative way of programming APB. The effect is the same as “Clear Readers” – for example if a time of 60 minutes is set for Reader 1, then 60 minutes after a card is used at Reader 1, it will Clear Zone 1 for that card. Also, if reader 2 is programmed to Clear Zone 1 then using the card at reader 2 has exactly the same effect as the expiry of the 60 minutes – the card may be used at reader 1 again).

Forgiveness

This sets a time when the APB to be reset. This could be either at midnight when the building is not occupied or during the lunch hour when the majority of staff would have left the building.

General Notes on Anti-pass back

If it is possible to move from one room to another without using a reader, then both rooms must be in the same zone(s).
If two readers allow access to one room, that room must be in two zones, any “Check Reader” that checks one of these zones must also check the other.

In addition to programming the Check and Clear Reader options for a reader, the Enable option must be used to turn on APB.

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How to program anti-passback

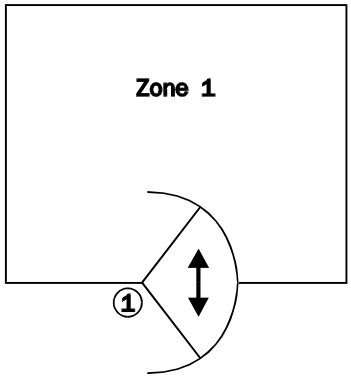
To program APB, think of the access control site as a number of “zones”. Each reader allows access into a zone. Reader 1 allows access to zone1; Reader 2 allows access to zone 2 and so on. This means that if both Reader 1 and Reader 2 allow access to the same room, then this room is considered to be both zones 1 and zone 2.

Decide what happens when a card is used at a reader:

1. Which zone will be "checked" - if the card is found to be already "in" that zone then access will be denied.
2. Which zone will be "cleared" - i.e. if access is granted which zone is the card leaving.

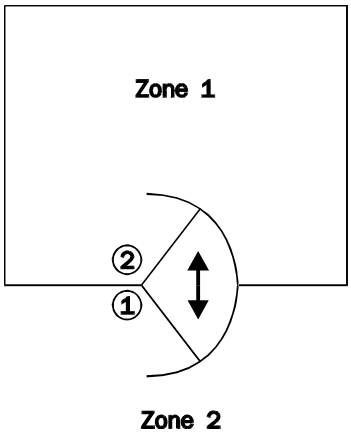
Examples

(i) One door, 1 reader (i.e. timed anti-passback); 1 hour time period



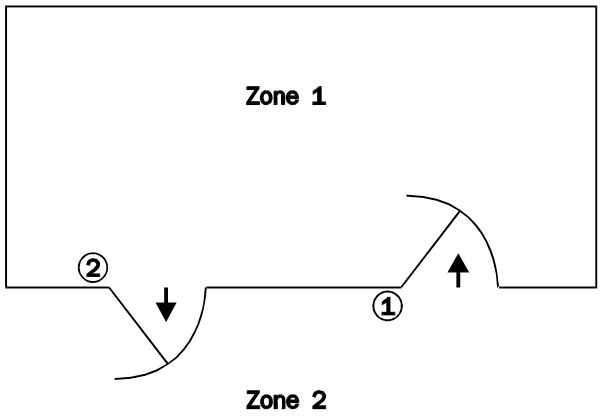
Reader Name	Check				Clear				Time
	1	2	3	4	1	2	3	4	
Reader 1	x								60
Reader 2									0
Reader 3									0
Reader 4									0

(ii) 1 door 2 readers; i.e. true anti-passback



Reader Name	Check 1	2	3	4	Clear 1	2	3	4	Time
Reader 1	x					x			0
Reader 2		x			x				0
Reader 3									0
Reader 4									0

(iii) Two doors, 1 reader each; i.e. True anti-passback



Reader Name	Check 1	2	3	4	Clear 1	2	3	4	Time
Reader 1	x					x			0
Reader 2		x			x				0
Reader 3									0
Reader 4									0

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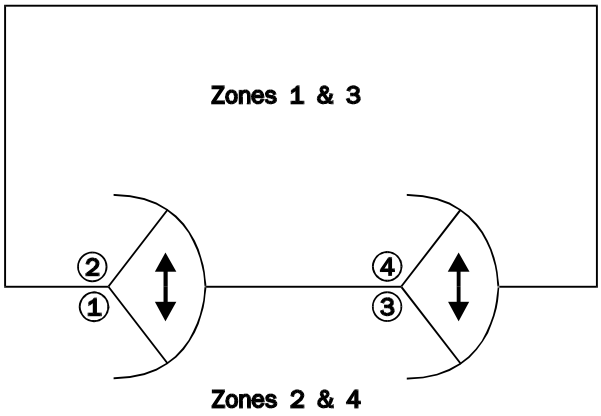
(iv) 2 doors 4 readers



Reader Name	Check				Clear				
	1	2	3	4	1	2	3	4	Time
Reader 1	x		x			x		X	0
Reader 2		x		x	x		x		0
Reader 3	x		x			x		x	0
Reader 4		x		x	x		x		0

LED Type

Menus	Default	Options
Reader Functions: Which Reader?: LED Type	Bicolor	Bicolor Red only

There are two types of reader LED in the TDSi range: red-only or bicolour (red and green). Verify the reader's LED type and set the appropriate option.

Down counter

Menus	Default	Options
Reader Functions: Which Reader?: Down Counter	Same as Reader number	0-16

This defines which counter will be decremented each time a card is granted access. Please refer to the Counters menu for more details on how to use the feature.

Up counter

Menus	Default	Options
Reader Functions: Which Reader?: Up Counter	Same as Reader number	0-16

This defines which counter will be incremented each time a card is granted access. Please refer to the Counters menu for more details on how to use the feature.

Reader Name

Menus	Default	Options
Reader Functions: Which Reader?: Reader Name	Reader n	16 characters

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This feature provides a means of assigning names to individual readers so that their location can be easily identified. The reader's name will only appear on the reader keypad display units and printouts. The maximum number of characters that can be entered for a reader is 16. The names are entered via the EXkeypad.

N-Card

Multi Card Access and Multi Tap

Menus	Default	Options
Reader Functions: Which Reader?: N-Card	Mode 0	Mode 0-5

A keyholder can be either a "standard" Keyholder or a "Trustee"
Mode 0 is the default OFF which is for a single person only required.
Mode 1 = Trustee or Trustee & Keyholder
Mode 2 = Trustee & Trustee
Mode 3 = Trustee & Keyholder
Mode 4 = Trustee & Keyholder or Trustee and Trustee
Mode 5 = Multi Tap

If Multi Tap is selected then by present the reader twice in quick succession you can unlock the Door permanently, and presenting the card twice again in quick succession you set the door to Lock but normal card access

N-Card Count

Menus	Default	Options
Reader Functions: Which Reader?: N-Card Count	2	2 - 9

Number of persons required to present their card. I.e. if 9 is chosen then each of the 9 keyholders must in turn present a card to the reader before access is granted.

N-Card Time

Menus	Default	Options
Reader Functions: Which Reader?: N-Card Time	10	0 - 255

The default is that you get up to 10 seconds for each keyholder to present their card, thus if you have 9 persons with 10 seconds each overall you can take up to 90 seconds to gain access if each waited the full 10 seconds. But if presented within a few seconds then the 10 second time starts again for the next keyholder and so on.

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4.4 Validate menu

Validate Card

Menus	Default	Options
Validate: Which Reader?: Validate Card	n/a	n/a

When validating a card, the amount of information you are asked for depends on the option chosen in the **Full ID Prompts** menu. Note that using a reader to enter the card number can speed up data entry: **see ID Reader.**

You may be asked for:

- I+T None, Trustee &/or Intruder
- PIN (leave this blank if Card+PIN is turned off at the chosen reader(s), or if you wish the cardholder to choose their own PIN on first use.
- Timegroup TG
- Name
- Expiry - start time and End time
- DDA
- APB - anti passback

Number

Card numbers are eight digits in length. To save time, the display shows the first five digits of the last card validated, followed by '***'. Use the left/right arrows to position the cursor, and then use the number keys to change the display so that it shows the number required. Then press “*”. If the card was already in memory then at this point its attributes can be modified.

Edit

I + T, R1 0 where R1 is the reader number I + T can be set for 0, 1-3 options
Option 0 is default for None (Standard Keyholder)
Option 1 is TRUSTEE
Option 2 is INTRUDER
Option 3 is Both TRUSTEE and INTRUDER

PIN

If this field is left blank and Card+PIN access is turned on, then the cardholder can select their own PIN the first time the card is used.

Time Group

This will be seen as e.g. TG, R1 0 this refers to TG (time group) R1 (applying to the reader number) and 0 is the default 24/7 access time group. These are Groups of Time Zones, which apply to any selected card. Each card can be in a different group for each reader (the time group doesn't apply to the door, it applies to the reader; in this way the user can control the direction through the door). Note that when someone is allocated to a time group, they will be barred unless a “free” TCL has been activated.

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Expiry

This allows a card to be validated with a fixed period of validity. A start date and time and an end date and time may be entered; if these are set the same the ID never expires
Each card can have a different expiry in every reader. (As the days tick away, if this function is accessed then the user can see how many days remain).
Note that even if this function is not being used, but the Card+PIN feature is, a card will become expired if the cardholder enters four wrong PINs in succession.

Name

When the EXkeypad is expecting a name then the number keys on the keypad become letter keys: the letters below the keys apply. Press a key once to display the number, press twice to show the first letter above the key; press again for the second and so on. When the desired letter appears on the display, press the right-arrow to move on to the next letter in the name.

DDA

Apply Yes if this person is disabled and requires the extra door open time

APB

Anti-passback applied for each of the Readers

Validate PIN

Menus	Default	Options
Validate: Which Reader?: Validate PIN	n/a	n/a

When validating a PIN, the amount of information you are asked for depends on the option chosen in the **Full ID Prompts** menu. See **Validate Card** for more details on card data (a PIN-only is treated the same as a card number).

Block Validate

Menus	Default	Options
Validate: Which Reader?: Block validate	n/a	n/a

This function allows the user to validate a range of cards. See **Validate Card** for more details on card data.

IMPORTANT
This operation can take a short while to be processed. In normal use this will only be a few seconds - but can occasionally take hours! Cards are stored first by type and then by number. The following guidelines will help to avoid long waits when validating cards.

- If more than one card technology is in use, it is better that Microcards are validated first, then Wiegand, Proximity cards and finally Magnetic
- If there are two blocks to be validated, then validate the LOWER of the two first.
- Do not exceed the available capacity of the ACU!

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When validating a card, the amount of information you are asked for depends on the option chosen in the **Full ID Prompts** menu. You may be asked for:

- Timegroup
- Expiry

Forgive ID

Menus	Forgive ID
Validate: Which Reader?: Forgive ID	Type 8 digit ID in to be forgiven

This feature is generally used in conjunction with the Continental Anti Passback software version. But can be used to forgive anyone's APB restrictions by entering their ID.

ID Reader

Menus	Default	Options
Validate: Which Reader?: ID Reader	0	0 1-16

This feature speeds up validation by enabling ID numbers to be entered via a selected reader instead of typing them into the EXkeypad. The ID reader feature can be used for validating cards, block validating cards, voiding cards and block voiding cards.
Whenever a card number is expected at the EXkeypad, present the card at the chosen reader. Then press (*) to confirm the entry.

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4.5 Void menu

Void ID

Menus	Default	Options
Void: Void ID: Reader Type	n/a	n/a

After entering the ID number the display will show readers at which the ID is currently valid. A ‘1’ denotes this and an ‘X’ means the ID is not valid in the reader. By changing a ‘1’ to a ‘0’ the card will no longer be valid in that reader.
Note that using a reader to enter the card number can speed up data entry: **see ID Reader.**

Void PIN

Menus	Default	Options
Void: Void PIN:	n/a	n/a

After entering the ID number the display will show readers at which the PIN is currently valid. A ‘1’ denotes this and an ‘X’ means the PIN is not valid in the reader. By changing the ‘1’ to a ‘0’ the card will no longer be valid in that reader.

Block Void

Menus	Default	Options
Void: Void ID: Reader Type	n/a	n/a

This function allows the user to void a range of cards, from a start number to an end number. Note that this function will only ever void all of the selected cards in every reader.

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4.6 Access Modes menu

Card+PIN

Menus	Default	Options
Access Modes: Control: Card+PIN	Programmed	Programmed Programmed/off Programmed/On Off On
Access Modes: Program: Card+PIN	None	Time schedule
Access Modes: Holidays: Card+PIN	All days	All days Only holidays Not holidays
Access Modes: Control card: Which Reader: Card+PIN	None	Validate a card to control this mode

The Card+PIN function provides a higher level of security than card-only access. This is because a found or stolen card would not be granted access without the PIN.
Every card can have a different PIN. The user can validate a PIN with the CARD or a PIN can be added to a card that is already in memory. The user can also change the PIN for a card. But perhaps the easiest way to use this feature is to let cardholders choose their own PIN by NOT validating PINs with the cards. Then, when cards are used for the first time a cardholder will be prompted for a PIN. Once entered, this PIN is stored in memory with the card.

How to enable Card+PIN access

There are four different ways of turning this mode of access on and off:
It can be turned on so that it stays on until the administrator turns it off
(**Access Modes: Control menu**)
It can be turned on and off using an input
(**Input menu**)
It can be turned on and off automatically at certain times
(**Access Modes: Program menu**)
It can be turned on by using a special (control) card or PIN at a specified reader or Dataline keypad
(**Access Modes: Control card menu**)

When Card+PIN is on

If Card+PIN is on and a valid card is presented at the reader the LED starts flashing at a faster rate. This signals the user to key-in the correct PIN assigned to that card. There are 10 seconds allowed for entering the PIN. If no PIN exists in memory against the card number (i.e. this is the first time the card has been used since the feature was turned on), the user can type any four digits. The user is allowed access and that PIN is put in memory and it will become the user's new PIN from that point onwards.

The following special cases apply when entering anything other than the correct PIN:

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Wrong PIN	If the digits entered don't match the number in memory then the user is given another three attempts to enter the PIN. If the user fails at the fourth attempt, then this is treated as an ALARM. Relays can be programmed to energize on such alarms. The card cannot be used again until it has been re-validated. If a mistake is made part way through the PIN entry, then press the "*" or "#" key and start again (this will not be counted as a wrong PIN). If four wrong PINs are entered in succession the card is disabled (it is set as "expired") and will not work again until it is re-validated.
Incomplete PIN Error! Bookmark not defined.	If a PIN entry is not completed in time then the user can try again; this is not counted as a wrong PIN as far as the "fourth wrong PIN" alarm is concerned.
Forgotten PIN Error! Bookmark not defined.	If a cardholder has forgotten their PIN, revalidate the card at the EXpert EXkeypad. The PIN is re-set to the unknown state, and the cardholder can choose a new PIN the next time the card is used.
Duress PIN	If the PIN entered is one higher in value than the PIN for that card (for example, 1235 is entered, when 1234 is in memory) then this causes a DURESS alarm. The lock release relay will still be energized.

PIN-Only

Menus	Default	Options
Access Modes: Control: PIN-only	Programmed	Programmed Programmed/off Programmed/On Off On
Access Modes: Program: PIN-only	None	Time schedule
Access Modes: Holidays: PIN-only	All days	All days Only holidays Not holidays
Access Modes: Control card: Which Reader: PIN-only	None	Validate a card to control this mode

In most respects, this feature works exactly like Card+PIN, except that there is no special case for **Forgotten PIN**.

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Card Only

Menus	Default	Options
Access Modes: Control: Card-only	Programmed	Programmed Programmed/off Programmed/On Off On
Access Modes: Program: Card-only	None	Time schedule
Access Modes: Holidays: Card-only	All days	All days Only holidays Not holidays
Access Modes: Control card: Which Reader: Card-only	None	Validate a card to control this mode

This access mode can be enabled and disabled in the same way as **Card+PIN**; please refer to that section for full details.

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4.7 Relays menu

Menus	Default	Options
Relays: Control: Which unit: Which Relay	Programmed	Programmed Programmed/off Programmed/On Pulse Off On
Relays: Program: Which Unit: Which Relay	None	None Lock Strike Alarm Shunt Door ajar (L) Door Ajar (R) Door Forced Duress Bad ID Bad PIN Input Input Fault Time schedule
Relays: Holidays: Which unit: Which Relay	All days	All days Only holidays Not holidays
Relays: Control card: Which Unit: Which Relay	None	Validate a card to control this mode
Relays: Control card: Which Unit: Which Relay	None	Validate a card to control this mode

There are four relays and a buzzer (which is programmed in the same manner as a relay) fitted as standard to each ACU. The following table shows the default usage for each relay for each mode (**mode** is set in the **ACU functions** menu):

	Mode			
Relay	R2D2	R2D1	R1D1	Lift Control
0	Door 1 ajar (L)	Door 1 ajar (L)	Door 1 ajar (L)	Unused
1	Door 1 Lock Strike	Door 1 Lock Strike	Door 1 Lock Strike	Floor 1
2	Door 2 Lock Strike	Unused	Unused	Floor 2
3	Door 1 Alarm shunt	Door 1 Alarm shunt	Door 1 Alarm shunt	Floor 3
4	Door 2 Alarm shunt	Unused	Unused	Floor 4

For each door, one of the relays must be designated as a lock strike; this leaves two or three relays that may be used for other purposes. Fitting a certain type of expansion board provides additional relays – EXout 32 adds 32 relays while EXin/out 32/16 adds 16 relays.
Each relay provides a single changeover contact. This means that when a relay is ON (energized), contacts may be open or closed—this depends on the connections made during installation.

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4.7.1 Control options

Control On

The relay will stay On until the user cancels this instruction.

Control Off

The relay will stay Off until the user cancels this instruction.

Not Controlled

The relay is neither enabled nor disabled. Programmed events or TCL's can now control the relays.

Programmed/On

This will turn the relay on immediately, and it will turn off the next time it is supposed to (i.e. an OFF TCL, the end of an alarm, or the opening of an input). This is most useful when the relay is programmed to turn on and off at certain times of day - it allows the user to turn it on early while allowing it to turn off at its normal time.

Programmed/Off

This will turn the relay off immediately, and it will turn on the next time it is supposed to (i.e. an ON TCL, the start of an alarm, or the closing of an input). This is most useful when the relay is programmed to turn on and off at certain times of day - it allows the user to turn it off early while allowing it to turn on at its normal time.

Not programmed

The relay will remain in its current state and follows TCL's.

Pulse

The relay is briefly enabled for the time specified in 'Hold Time'.

4.7.2 Program options

Relays programmed by door events can only use doors on the same controller. An event and a TCL can program a relay. Relays can be controlled by inputs on any unit and by input faults on ALL inputs on one or ALL units. Multiple relays can have the same use e.g. Door 1 lock strikes.

Lock Strike

This function controls the lock mechanism that locks and unlocks the door when a valid card has been presented to the reader.

Alarm Shunt

This function is provided so that a person who is allowed through a door can get through the door without setting off the intruder alarm system. The relay must be connected across the alarm contacts so that as far as the intruder alarm is concerned the door appears to stay shut.
The relay will turn on at the same time as the lock strike. If the door does not open, the relay will turn off when the lock strike time ends. If the door does open, then it will turn off when the door closes, no matter how much later that occurs, unless the user has re-programmed the Alarm Shunt Off event.

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Door Ajar (L)

The alarm shunt relay de-energizes when the Door Ajar (Local) time expires. This does not require a relay to be programmed as a Door Ajar (Local) alarm, and does not even require the Door Ajar (Remote) message to be enabled. The relay can be enabled when Door Ajar (local) occurs.

Door Ajar (R)

Relay is enabled when Door Ajar (R) occurs.

Door Forced

Opening a door without the lock strike relay enabled creates a door forced message.

Duress

The duress event occurs when someone uses a PIN one number greater in value than the correct PIN, whether as part of a Card+PIN entry, or a PIN-only entry. This will send a pulse to a specified relay for the time defined in HOLD-ON TIME.

Bad ID

The Card or PIN is not in the memory of the ACU. This will send a pulse to a specified relay for the time defined in HOLD-ON TIME.

Bad PIN

This will be displayed when the user has input an invalid PIN 4 times. This will send a pulse to a specified relay for the time defined in HOLD-ON TIME.

Input

Input can be used either for monitoring switch contacts (for example, an emergency exit) or for turning relays on and off. Input On enables the relay. Note that while the Relays menu can be used to have multiple Relays controlled from a single input, the Input menu allows a single Relay to be controlled by multiple inputs.

Input Fault

The Input Fault occurs when an input is connected to the EXpert or EXpander and a fault occurs with that particular input. This occurs when an input has been incorrectly configured as a supervised input

Not Used

The relay is not controlled by an event.

Timed

The user can set a time, day-of-week codes, and whether the relay is to come ON or go OFF, or Pulse.

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4.7.3 Holidays

The Holidays setting applies only when a Relay is set to follow a time pattern, and is used to determine what happens on days defined as holidays. The options are:

- All days
- Not Holidays
- Only Holidays

4.7.4 Hold-on time

Certain events do not have a duration, in which case the relay is energized for the time specified here. This applies to Duress, Bad ID, Bad PIN and TCL's of the type "Pulse".

4.7.5 Control Card

This allows the user to validate a card (or PIN) which, when used at a reader, will cause the chosen relay to turn on and off. This works as if the user had used the Control option; the first time card is used it is like selecting "on"; the second time it is like selecting "programmed". For a Control PIN to work, PIN-only must be on.

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4.8 Inputs menu

Menus	Default	Options
Inputs: Which unit: Polarity	Normally Open	Normally Open Normally Closed
Inputs: Which unit: Type	Digital	Digital UK Supervised US Supervised
Inputs: Which unit: On Delay	0	0-6553 (tenths of seconds
Inputs: Which unit: Off Delay	0	0-6553 (tenths of seconds
Inputs: Which unit: Use	depends on chosen input	Unused Door sensor Egress Relay drive Card+PIN PIN-only Card Only
Inputs: Which unit: Up counter	0	0-16
Inputs: Which unit: Down counter	0	0-16

4.8.1 Application

Inputs can be used either for monitoring switch contacts (for example, an emergency exit), or for switching time groups or access modes on and off. When an input changes state, a message is generated. Any input can be set to digital (normal), UK supervised or USA supervised. Inputs can affect ACU's in the following ways:

- Switching an input from open circuit to closed circuit or vice versa will result in an event message; this will be sent to the EXkeypad, PC or printer depending on what is installed.
- Relays (outputs) can be programmed to 'follow' inputs: as the input is switched from open circuit to closed circuit or vice versa the relay will switch to the same state. The user can choose any relay (apart from the lock strike relays) to follow any input; for example Relay 9 could follow Input 3. In the case of supervised inputs, a relay can be programmed to activate if an input is "tampered" with; i.e. short-circuit or open circuit. Note that while the Relays menu can be used to have multiple Relays controlled from a single input, the Input menu allows a single Relay to be controlled by multiple inputs.
- The user can program Reader Access Modes to follow inputs: as the input is switched from open circuit or vice versa, the access mode will turn on and off.

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There are eight inputs fitted as standard to each ACU, plus a “virtual input” that is on if the mains power has failed to the ACU (this requires that the ACU is fitted with a stand-by battery). The following table shows the default usage for each input for each mode (**mode** is set in the **ACU functions** menu):

Number	Mode			
	R2D2	R2D1	R1D1	LIFT
0	Power monitor	Power monitor	Power monitor	Power monitor
1	Door 1 Sense	Door 1 Sense	Door 1 Sense	Floor 1 select
2	Door 1 Egress	Door 1 Egress	Door 1 Egress	Floor 2 select
3	Door 2 Sense	Unused	Unused	Floor 3 select
4	Door 2 Egress	Unused	Unused	Floor 4 select
5	Unused	Unused	Unused	Floor 5 select
6	Unused	Unused	Unused	Floor 6 select
7	Unused	Unused	Unused	Floor 7 select
8 (connected to Tamper switch)	Unused	Unused	Unused	Floor 8 select

Any input except input 0 is capable of being programmed to operate as a supervised input. Multiple inputs may have the same use e.g. two egress buttons for one door. Inputs can only be used for door sense and egress on the same controller unit.

Polarity

This determines what state is regarded as normal, i.e. “Off”. The options available are N/O (Normally Open) and N/C (Normally Closed).

Type

There are three settings that each input and output can be configured to: - US, UK and Digital supervision. They vary in the way in which they perform.

- Digital: This type can detect only on and off states at the device being monitored.
- UK Supervision: This involves the use of two resistors and permits two types of tampering to be detected: short-circuits and open circuits
- US Supervision: This involves the use of one resistor and permits only short-circuit tampering to be detected

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4.8.2 On delay/Off delay

This function allows the user to decide how long an input should remain in a certain state before the state is recognised. This can be used for example, to monitor a door that has no access control. The user may be unconcerned if the door is open for a few seconds at a time, but may want to know if door has been left open for several minutes. The delay can be used to trigger a relay message only if the door is open for more than say, 60 seconds.

4.8.3 Use

Door Sensor

This allows you to monitor whether a door is open or not.

Egress

Each door is provided with an input, which can be used for a 'Free Egress' function. If this input is momentarily closed circuit, then the lock will be released just as if a card had been used; i.e. for the length of the lock release time.
There are two possible uses for this:

- The 'door forced' alarm will be triggered if the door opens without the lock having been released. Rather than installing a reader on the outgoing side of a door, installing an egress button means that the door forced alarm doesn't occur.
- Installing a push-button in the reception area means that the receptionist can allow access to visitors without cards.

If the input is left closed circuit then the lock will remain released. This can be useful if there are periods when no access control is required.

Relay drive

This allows you to choose a relay that will be on when the input is on, and vice versa. More than one input can control the same relay.

Card+PIN, PIN-Only, Card-only

This allows a choice of access mode that will be on when the input is on, and vice versa

4.8.4 Up counter/ Down counter

This function allows the user to set specific inputs to control specific counters in both directions. The chosen **Up counter** will be incremented each time the input is switched on, while the chosen **Down counter** will decremented.

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4.9 Counters menu

Menus	Default	Options
Counters: Value: Which Counter: No.	0	0-65535
Counters: Limit: Which Counter: Which Limit: No.	0	0-65535
Counters: Relay: Which Counter: Which Limit: Which Relay	0	0-36
Counters: Reset: Which Counter:	Never	Never Timed Now
Counters: Reset Value: Which Counter:	0	0-65535

The purpose of the counters feature is to monitor the number of occurrences of certain types of event, and to operate a relay if limits are exceeded.
EXpert has 16 counters, and each counter has 4 limits.
Counters are only ever incremented or decremented by **Readers** (and then only by Access Granted events) and **Inputs –** please refer to those menus for more details.
Value
This allows you to view and modify the current value of any counter.

Limit

This is used to sets the value for each of the 4 limits, and a hysteresis value. The hysteresis value determines how far a counter must fall below the limit before the relay will be de-energised.

For example, if a limit is set to 100 with a hysteresis of 3, then the associated relay will be energized when the counter value reaches 100, but will not de-energise until the counter falls to 96 (99 - 3).

If the hysteresis value is set to the same as the limit value, then the associated relay will remain permanently on once its limit has been reached, even if the counter falls back to zero (resetting the counter will de-energize the relay).

Relay

This determines which relay is associated with a chosen counter limit. This can be used for example to operate an audible alarm when a counter reaches the limit, or it could be used to disable a reader to prevent further access.

Reset

This feature is used to reset the counter function. There are three options for reset:
Never: the counter is never reset
Timed: the counter is reset at the specified time
Now: a reset is performed immediately

Reset Value

This allows you to set a value other than zero to be the value after reset.

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4.10 Timegroups menu

Menus	Default	Options
Timegroups: Control	Programmed	Programmed Programmed/off Programmed/On Off On
Timegroups: Program	None	Time schedule
Timegroups: Holidays	All days	All days Only holidays Not holidays
Timegroups: Control card: Which Reader	None	Validate a card to control this mode

Timegroups are used to restrict access through certain doors to certain people during certain periods of the day. Different rules can apply on different days and allowed in on holidays. Some simple examples will make clear the usefulness of this function.

Example 1

Everybody in a factory and the office generally starts work at 8 am (0800) and finishes at 5pm (1700), Monday to Friday. Office workers are to be allowed access during weekends and holidays, while top management must be allowed access at all times. In this case employees fall into three groups:

Group 0—top management—by leaving their cards in Time Group 0 (the default) they will automatically be allowed access 24 hours a day, 7 days a week, every day of the year.

Group 1—office staff—use time group programming to program time group 1 to allow access from, say, 0730 to 1730 for seven days a week including holidays. In addition, use holiday programming to set up the dates of the forthcoming holidays. It is then possible to allocate all the cards for the office staff to group 1.

Group 2—factory staff—use time zone programming to program time group 2 to allow access from 0730 to 1730 for Monday to Friday, excluding holidays. Then allocate all the cards for the factory staff to group 2.

Example 2

A single ACU is to be programmed to control two doors—the main entrance to a building (door 1), and the door into the canteen (door 2). Since the canteen is unsupervised except at meal times, non-canteen staff should be excluded at all other times.

Group 1—all working hours—program this group for, say, 0730 to 1730. Then allocate cards for canteen staff in-group 1 for door 1, and group 1 for door 2 (canteen staff can go through both doors at all times).

Group 2—meal times—program this group for, say, 1200 to 1400. Then allocate cards for non-canteen staff in group 1 for door 1, and group 2 for door 2 (non-canteen staff can go through the main entrance at all times, but into the canteen only at meal times).

Note that normal time zone programs can be overridden when required. This is useful if, say, a group of people who would not normally work weekends are asked to come in to complete an urgent task. Rather than re-

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program every card in the group, simply select that group to have FREE access.

Notes
Different time groups can be applied to each reader at which the ID is valid.

Zones and groups explained

It is necessary at this point to define the difference between time ZONES and time GROUPS:

Time Zones

This is a period during which access is allowed. Several time zones can be created by programming two Time Control Lines (TCL's). The first TCL is the start time (access is FREE from this time) and the second TCL is the end time (access is BARRED from this time). The days of the week that the time zone applies to can also be set (using the code Monday=1, Tuesday=2 and so on). For example, consider the following two TCL's:

0730 12345 FREE
1700 12345 BARRED

This means that on Monday, Tuesday, Wednesday, Thursday and Friday, access will be allowed (to people whose cards have been allocated to this time group) between 7.30 am and 5.00 p.m. So with two TCL's, five time zones have been created.

The user can program many TCL's. By default there is a limit of 500 time zone TCL's AND relay TCL's (the TCL's for time zones and relays share the same area of memory) but this can be changed in **Memory Options**.

Time Group

A time group is a group of applied restrictions covering an entire week. The user can program up to 15 groups.
During card validation, the user will allocate each person to a time group. People can be allocated to different time group in each reader.
There are several points to be considered before time groups will work:

1. The time and date must be set correctly: see CLOCK
2. The user must program the required TCL: this is explained later in TIMEGROUPS PROGRAM
3. The user must allocate cards to the required time groups: see VALIDATE (note that Full ID Prompts must be turned on).
4. The required time groups must be set to ACTIVE: this is explained later in TIMEGROUPS CONTROL

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4.10.2 Control

Free

All cards in the chosen Time Group will be allowed access until the user cancels this instruction

Barred

All cards in the chosen Time Group will be denied access until the user cancels this instruction

Active

The chosen Time Group will become Free or Barred according to what the user has programmed it to do. It may turn Free or Barred immediately after the user executes this instruction, if its programming calls for it.

Active/free

This will turn the Time Group to Free immediately, and it will turn to Barred the next time it is supposed to (i.e. a Barred TCL or the opening of an input). This can be useful when the user wants a group of workers to start work earlier than normal.

Active/barred

This will turn the Time Group to Barred immediately, and it will turn to Free the next time it is supposed to (i.e. a FREE TCL or the closing of an input).

4.10.3 Program

This allows the user to program time control lines (TCL's), which will cause Time Groups to become Free and Barred automatically according to time-of-day and day-of-week.

4.10.4 Holidays

The Holidays setting applies is used to determine whether the Time Group schedule applies on days defined as holidays. The options are:

- All days
- Not Holidays
- Only Holidays

4.10.5 Control Card

This allows the user to validate a card (or PIN) which, when used at a reader, will change the current state of the Time Group, in the same way as using the Control option in the Timegroups menu. There are three types of control card that can be created:

- **Toggle**: each use of the card changes the current state of the group; from Active to Free and back again.
- **On**: Sets the group to Barred
- **Off**: Sets the group to Free

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4.11 Messages menu

Menus	Default	Options
Messages: Access Messages: (message)	On	On Off
Messages: Alarm Messages: (message)	On	On Off
Messages: Input Messages: (message)	On	On Off
Messages: Relay Messages: (message)	On	On Off
Messages: Mode Messages: (message)	On	On Off
Messages: Timegroup Messages: (message)	On	On Off
Messages: Counter Messages: (message)	On	On Off

Messages are reports of events, which will appear on the EXkeypad, at a printer or at a PC. When at the EXkeypad, messages often have to be coded due to the limited space. The message menu allows the user to turn off unwanted messages. Every message has its own on and off control, and different selections can be made for each door or reader.

Access messages	All ID messages
	Valid ID
	Invalid ID
	Incorrect APB
	PIN timeout
	Incorrect TG
	4th wrong PIN
	ID not in reader
	Expired ID
	Control ID on
	Control ID off
	Mantrap enforced
	Incorrect PIN
	Door locked shut
Alarm messages	All alarms
	Door opened
	Door closed
	Door forced
	Door ajar (L)
	Door ajar (R)
	Egress On
	Egress Off
	Duress
	Read error
Input messages	All input states
	Input On
	Input Off
	Input O/C
	Input S/C
	Input ???

Relay messages	All relay states
	Relay free
	Relay On
	Relay Off
	Relay pulse
Mode messages	All modes
	C+P disable
	C+P enable
	PO disable
	PO enable
	Card disable
	Card enable
Timegroup messages	ALL TG states
	TG barred
	TG free
Counter messages	All counters
	Counter down
	Counter up
	Counter reset

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For those message categories which have "all messages" option selected (access, alarms, inputs, relays, mode, TG, counter system messages) “all messages” must be enabled for the individual message selections to apply. If ‘disabled’ is selected then all messages will be disabled no matter what was previously selected.

4.12 Printouts menu

Menus	Default	Options
Printouts: System	n/a	n/a
Printouts: Readers	n/a	n/a
Printouts: Doors / Lifts	n/a	n/a
Printouts: IDs	n/a	n/a
Printouts: Access Modes	n/a	n/a
Printouts: Relays	n/a	n/a
Printouts: Inputs	n/a	n/a
Printouts: Time Groups	n/a	n/a
Printouts: Counters	n/a	n/a
Printouts: Messages	n/a	n/a

If an EXpert is connected to a printer, it is possible to print a report on each of the programming functions to view their current status.

To request a report the user will first have to change the communication mode from COMPUTER LINK to IMMEDIATE. This will then enable a new heading within the menu structure thus allowing the required print out to be selected.

Event reporting is suspended during the printing of the report. The suspended events will be reported when the user quits from the main menu.

Note: Printouts can be aborted at any time by pressing any key on the EXkeypad

4.13 Communications menu

Menus	Default	Options
Communications: Unit Number	0	0-1022
Communications: Mode	Computer-link	Computer-link Immediate
Communications: Baud Rate	38,400 baud	1200-115200 baud
Communications: Parity	None	None Even Odd
Communications: Flow control	None	None CTS XON/XOFF CTS+XON/XOFF

This part of the manual can be ignored if the controller is NOT connected to a printer or a computer.

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4.13.1 Unit number

By default the EXpert unit number will be set to 1. When set to unit 0, the EXpert will operate in immediate mode, suitable for linking to a printer or a PC running HyperTerminal. If a computer link is detected the mode will switch to computer link.

4.13.2 Mode

Immediate mode.

This is the default mode if the unit number is set to 0.
The controller will transmit details of events as and when they occur. This is usually to a printer or PC with HyperTerminal; the ACU must be programmed to match the communications parameters of the printer/PC (baud rate, parity etc.). If the EXpert is connected to a parallel printer then a serial/parallel converter must be used; the ACU must then be programmed to match the parameters of the converter.
Transmission will not occur if the handshake conditions prevent this; the EXpert stores the events until it can transmit them. The Memory Options feature determines the number of events that the ACU memory can hold (before starting to overwrite the oldest events).

Computer link

The controller will only transmit when requested to by a computer. This communication mode defaults to 38400 baud but will work at other rates providing the PC is set to the same baud rate. All other communications parameters default to suit the special communications protocol used by TDSi.
If the PC does not poll the ACU for a period, then the ACU stores the events until it can transmit them. The Memory Options feature determines the number of events that the ACU memory can hold (before starting to overwrite the oldest events).

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4.14 Clock menu

Menus	Default	Options
Clock: Time	n/a	n/a
Clock: Date	n/a	n/a
Clock: Date format	DDMMYY	DDMMYY MMDDYY YYMMDD
Clock: Clocks forward	00-00	01-01 to 31-12
Clock: Clocks back	00-00	01-01 to 31-12
Clock: Holidays	n/a	n/a

4.15 Diagnostics menu

Menus	Default	Options
Diagnostics: Input test	n/a	n/a
Diagnostics: Relay test	n/a	n/a
Diagnostics: RAM test	n/a	n/a
Diagnostics: ROM CRC	n/a	n/a
Diagnostics: Comms test	n/a	n/a

4.15.1 Input Test

This causes a 16–character display of '1's and '0's on the EXkeypad, which displays the current state of each input (‘1’ denotes the input state is On). The display is constantly being updated so any change in input status is immediately visible.
The display looks something like this:

```
Input test        101
0001000000000010
```

The number of the currently selected input is displayed in the top right hand corner. The display can show more than 16 inputs used on the unit. Use the > button to move to the far right to display the remaining inputs. Input diagnostics does not affect the operation of the inputs while this function is being used.

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4.15.2 Relay Test

The number of the currently selected outputs is displayed in the top right hand corner. The display can only show the first 16 outputs of 40 possible outputs. If more than 16 outputs are used on the unit, use the > button to move to the far right to display the remaining outputs. Output diagnostics does not affect the operation of the outputs while this function is being used. The display shows the current state of each relay on the specified unit. The state of the selected relay can be changed by using the up and down buttons.

Relay test 0004 **0001**

This function allows the user to turn relays ON and OFF for testing purposes. Relay diagnostics displays the current real-time state of all relays on the specified unit. Specified relays can be enabled and disabled by changing the required one from a '0' to a '1'. Looking at the top right corner of the EXkeypad, it will indicate which relay is being held ON. Before exiting the diagnostic mode it recommended that all relays are returned to their original state because exiting the menu by pressing the "#" will save the changes applied.

4.15.3 RAM Test

This performs a non-destructive RAM test (i.e. no information is lost or changed in any way) and reports pass or fail.

4.15.4 ROM CRC

This performs a checksum of the contents of the ROM and compares it with the factory-calculated check sum, which is programmed into a special location in the ROM. The display then shows PASS or FAIL.
Warning: all access control functions are suspended during this operation.

4.15.5 Comms test

This feature causes the message 'TDSi' to be sent repeatedly to the printer or HyperTerminal. This is very useful for checking that installation and set-up of the communications link are correct.
To use this feature "Immediate mode" must be selected (using the Mode option in the Communications menu).

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4.16 Resets menu

Menus	Default	Options
Resets: Warm restart	n/a	n/a
Resets: Erase ID store	n/a	n/a
Resets: Erase Events	n/a	n/a
Resets: Reset Parameters	n/a	n/a
Resets: Warm restart	n/a	n/a

These resets allow the user to clear out all or part of the information held in the system. In normal use it should not be necessary to use any of these resets.

4.16.1 Warm restart

Executing this function can do no harm, although access control functions will be suspended for a few seconds while the reset is executed. This reset has a similar effect to powering down then powering the unit up again. Nothing is lost from memory.

4.16.2 Erase id store

This reset erases all cards and PINs from memory including all associated functions such as PINs, names and expiry dates etc.

4.16.3 Erase events

This refers to any un-transmitted events in the event trail record memory. For example, if the printer ran out of paper then the event messages would be held in memory until the situation was rectified. Then all the events would be sent to the printer - this could be quite a lot of information and the user might decide that it would take too long. The user would use this function to clear out the trail record.

4.16.4 Reset parameters

This refers to all the programmable functions of the ACU. For example, lock strike time, whether Card+PIN is in use, which messages have been turned off etc. If the user executes this reset then ALL parameters will be returned to their Default settings. Apart from cards, PINs and trail record, the only area NOT affected by this reset is the clock/calendar and communication settings.

4.16.5 System reset

This reset is the same as executing all four of the above resets, plus it also resets the clock and calendar.

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4.17 Password menu

Menus	Default	Options
Password: Change Password	1234	any 4 digits
Password: Multi-user mode	Off	On Off
Password: Modify User: Change Password	1234	any 4 digits
Password: Modify User: Permissions : ACU Functions	On	On Off
Password: Modify User: Permissions : Door Functions	On	On Off
Password: Modify User: Permissions : Lift Functions	On	On Off
Password: Modify User: Permissions : Reader Functions	On	On Off
Password: Modify User: Permissions : Validate	On	On Off
Password: Modify User: Permissions : Void	On	On Off
Password: Modify User: Permissions : Access Modes	On	On Off
Password: Modify User: Permissions : Relays	On	On Off
Password: Modify User: Permissions : Inputs	On	On Off
Password: Modify User: Permissions : Counters	On	On Off
Password: Modify User: Permissions : Timegroups	On	On Off
Password: Modify User: Permissions : Messages	On	On Off
Password: Modify User: Permissions : Printouts	On	On Off
Password: Modify User: Permissions : Communications	On	On Off
Password: Modify User: Permissions : Clock	On	On Off
Password: Modify User: Permissions : Diagnostics	On	On Off
Password: Modify User: Permissions : Resets	On	On Off
Password: Modify User: Permissions : Unit Control	On	On Off

The default mode for this feature is single-user: a single password allows access to all features. Only the password can be changed in this mode of operation.

Multi-user mode makes it possible for a supervisor to allow up to 10 other people to have access to programming specified features within the ACU, while prohibiting access to all other features.

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When multi-user mode is enabled

To gain access to EXkeypad programming functions, start by pressing any key: the display now asks for a user ID (User ID 0 is reserved for the supervisor). Enter a user ID (1-10), then enter a password; if the supervisor has not defined a password for this user ID then enter any number (4-8 digits) and press "*" - this password is assigned to this user ID from now on. The supervisor must have defined user permissions for that user to be accepted.
From this point on, users other than the user will only be allowed access to pre-determined main menu items.

Note.
If multi-user mode is disabled, it can be turned on again at a later date and all 10 users and their settings will remain intact.

If an incorrect password is entered

Anyone wanting to program the controller must first key-in the correct password. If the wrong password is entered then the message 'INCORRECT PIN' will be displayed. If four incorrect passwords are entered in a row then the 'EXkeypad DISABLED' message will be displayed and the EXkeypad will become 'locked out'. The EXkeypad will be locked out for 10 minutes; another attempt to enter a password during this time will cause the lock-out timer to be reset to 10 minutes.

What to do if the password is forgotten

There is no secret "master" password. This is to guarantee security. But if the password is forgotten then the only way to re-enable the EXkeypad is to disconnect all power and switch off the memory battery for at least 15minutes to the EXpert. All data will be lost and all programmable functions will be returned to their default settings.
The password will now be restored back to the default setting 1234. The user will have to re-program everything in the controller, including card numbers.

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4.18 Unit Control menu

Menus	Default	Options
Unit Control : Reset Unit	n/a	n/a
Unit Control : Unit info	n/a	n/a
Unit Control : Identify Unit	n/a	n/a
Unit Control : UID ←-→ Unit	n/a	n/a
Unit Control : Change Unit	n/a	n/a
Unit Control : Number of Units	7	1-7

4.18.1 Reset unit

This function allows the user to specify a single EXpander and then perform a reset on it from the EXkeypad without having to go to the unit in question and power it down. This reset will only need to be carried out when instructed to do so by either TDSi technical support staff or by the access control installation company.

4.18.2 Unit info

This function gives a visual display of which EXpander units are online out of the total number of units in the system (as defined in number of units). The character furthest to the left indicates sub unit 1, the next character is sub unit 2 up to a maximum of seven units. Online units are represented by their sub unit numbers, while an 'X' denotes the unit is offline. Pressing a number of an online unit will display the information for the corresponding unit.
Note: pressing "0" will display unit info for Master ACU.
Whilst in this programming feature it is possible to identify the build version of firmware currently fitted in any EXpander. Press the unit number of any of the boards that are online, which will be a number between 1 and 7. The version will now be displayed on the EXkeypad for that EXpander board.

4.18.3 Identify unit

This function would primarily be used by the installer, to identify a board's sub unit number. Within each EXpander there is a small audible speaker, which will pulse on and off when selected to do so. When this feature is utilised to identify a sub unit the unit's beeper will emit a beep every 30 seconds.

4.18.4 UID ←-→ Unit

This allows you to see what the UID number is for each of the Slaves (Expanders)

4.18.5 Change unit

This option allows the user to change the EXpander sub unit number to another available sub unit number.

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4.18.6 Number of units

This function allows the user to specify how many EXpander units there are in the system. By default seven units are specified, even if only the EXpert is online. Specifying no units will not mean that the performance of the system will be improved. However, reducing the number of available units will increase the memory space available for IDs, TCL's and events. Reducing the number of units also removes redundant doors and readers from the EXkeypad menu when programming the system. So, when using an EXpert simply as a 2-door controller with no EXpanders, set the number of units to 0.

Note
Changing the number of units will re-adjust the memory partition thus erasing the IDs, events and TCL's. For this reason (unless the number of units in the system is guaranteed not to change), it is recommended to leave number of units set to 7.

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5. EXkeypad Messages

Event messages will appear on the bottom line of the EXkeypad display and are in plain text. For example:

```
eXm       10:56
M00123456   A1
```

The top line is showing the current time (not the time of the last event). The bottom line shows the last event (note that message types that have been turned off will not appear). This can be interpreted as follows:

M00123456	**Card number** 00123456 **Card Technology**: Microcard (see table for other codes)
A1	**Event** Access Granted (see table for other codes) **Location** Reader 1

Letter preceding card number	Card Technology
M	Microcard® (i.e. infra-red card)
W	Wiegand
P	Proximity
A	Mag-stripe (standard also for TDSi EXprox)
C	26-bit Wiegand
K	PIN-only
I	Indeterminate

Letter before reader number	Event
A=	access granted
B=	ID not in memory
C=	ID not valid for reader
D=	ID expired
E=	out of Time Zone
F=	anti-passback enforced
G=	PIN time-out
H=	wrong PIN
I=	4th (or more) bad PIN
J=	mantrap enforced
K=	lock latched off
N=	control card ON
P=	control card OFF

Note

Use the up and down arrows on the EXkeypad to view the previous events. All previous events can be viewed in this way (depending on the number of events memory).

Use the left and right buttons on the EXkeypad to display the date and time of the currently displayed event.

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